

ORDNANCE & EXPLOSIVE RESPONSES

PREPARED FOR THE

EPA REGION III

CHEMICAL EMERGENCY PREPAREDNESS
AND PREVENTION CONFERENCE

PREPARED BY

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ORDNANCE & EXPLOSIVE RESPONSES

INTRODUCTION - Every day, thousands of pounds of military ordnance and explosives are in transit over public highways. At the same time, many thousands of pounds of non-military explosives are also on the road. When an accident occurs, who should be the responders and how should the incident be handled. Most small to medium size cities and counties do not have the specialized response teams that are capable of analyzing the situation and determining what the correct actions should be. The purpose of this presentation is to outline the proper response for these types of situations and to determine what the emergency response actions should be. The decision process can be streamlined, resulting in a safe, more efficient, and a cost effective approach.

HEADLINE 1. TRACTOR TRAILER TRANSPORTING BLACK POWDER RUNS OFF THE ROAD AND INTERSTATE 95 IS CLOSED FOR 16 HOURS

QUESTION: WAS THIS 16 HOUR CLOSURE NECESSARY?

ANSWER: NO

HEADLINE 2. TRACTOR TRAILER TRUCK CARRYING U.S. NAVY TORPEDOES RUNS OFF THE ROAD AND MAJOR EAST WEST INTERSTATE IS CLOSED FOR 12 HOURS

QUESTION: WAS THIS 12 HOUR CLOSURE NECESSARY?

ANSWERS: 1. FOR THE EXPLOSIVES IN THE TORPEDOES - NO
2. FOR THE TOXIC FUEL IN THE TORPEDOES - YES

HEADLINE 3. HIGHWAY CLOSED FOR 4 HOURS AFTER UNSECURED DOOR ON TRUCK OPENS AND BLASTING CAPS ARE SCATTERED OVER SEVERAL MILES OF ROUTE 301

QUESTION: WAS THIS 4 HOUR CLOSURE NECESSARY?

ANSWER: YES

All of the headlines above are based on events that have occurred in areas throughout the United States. Any of these situations when they occur are a dilemma that must immediately be addressed.

Nearly every town or city has an emergency manual that covers most common emergencies related to fires, floods, tornadoes, or other man made or natural disasters. Few of these emergency manuals have instructions for dealing with an accident involving military ordnance such as a truck load of U.S. Navy torpedoes that just over turned in downtown Smithsville, Kansas. Being so far removed from the oceans, the last thing you would anticipate finding in this locale would be a broken open shipping container with a badly battered torpedo laying in the middle of Main Street. In addition to the torpedo laying in the street, a closer inspection reveals 19 more of the shipping containers with varying degrees of damage.

WHAT DO YOU DO?

Initial Actions - Many of your initial actions for any disaster will at least initially be applicable to this incident. The standard requirements for your available emergency services assets will be applicable, i.e.:

- ! Police Department (PD) - The police to control the scene to include evacuation and access / entry.

NOTE: DUE TO THE POTENTIAL OF AN EXPLOSION, REMOTE FIRE FIGHTING PROCEDURES SUCH AS FIXED (UNMANNED) NOZZLES SHOULD BE USED TO SUPPRESS AND/OR EXTINGUISH BURNING EXPLOSIVES.

- ! Fire Department (FD) - The fire departments initial response should be to ensure that fires, leaking fuel, or other threats are brought under control. As first responders they also will have the basic emergency training required for a Level A through Level D Personal Protective Equipment Response. In the case of a leaking toxic substance such as a missile fuel from a military ordnance item, the ability to dress out in the proper protective clothing and equipment may be critical to controlling the scene and rescuing casualties.
- ! Emergency Medical Services (EMS) - In addition to taking care of any initial casualties from the accident scene, the EMS personnel should set up a triage area and stand-by for potential casualties.

IDENTIFYING THE PROBLEM

Placards - In accordance with Department of Transportation (DOT) regulations, the vehicle must be

placarded (Slide 2. Explosive Hazard Classifications) as to what kind of explosives are contained in the munitions.

Department of Transportation (DOT) Hazard Class 1

- Division 1.1 Explosives with a mass detonation hazard
- Division 1.2 Explosives with a non-mass detonating - fragmentation (projectile) hazard
- Division 1.3 Explosives with a mass fire hazard
- Division 1.4 Explosives with a moderate fire - no blast hazard
- Division 1.5 Very insensitive explosives i.e blasting agents such as ANFO
- Division 1.6 Extremely insensitive ammunition

Manifest - The manifest or other shipping documents also can provide an accurate identification of the explosives in the munitions.

Labeling - The military in most cases will have the model numbers and nomenclature (name) of the items being shipped stenciled or labeled on the boxes or shipping containers, i.e.

20 each M72A1 66mm LAW Rockets

WHAT TO PREPARE FOR

Explosive Events - At the time of detonation there will be a number of associated events which include a blast wave, fragmentation, and a release of thermal energy.

Blast Wave - The blast wave will travel outwards in a 360 degree radius from the point of detonation. Related to this blast wave are three effects that can cause a great amount of damage. The impact and passage of the blast wave can cause severe damage to both personnel and structures.

Shock Wave - The leading edge of the blast wave will strike any objects in its path with a great deal of energy. The shock wave is capable of knocking down building and causing severe

physical damage to personnel.

Over Pressure - Also as a part of the advancing shock wave there is a corresponding build up of pressure or a over pressure. This pressure can be sufficient to weaken structures and crush personnel. Personnel under cover but too close to the detonation point can be killed or injured by the over pressure.

Vacuum - As the shock wave and over pressure move out, it leaves behind a vacuum which will cause structures weakened by the shock wave and over pressure to collapse upon their selves and can also cause suffocation of personnel in this area. Personnel under cover but too close to the detonation point can be killed or injured by the vacuum. This is especially true for personnel who have already been injured by the shock wave or over pressure.

Fragmentation - Military ordnance usually consists of some type of metal body filled with explosives. At the time of detonation, the fragmentation from the munition casing will travel various distances. Secondary fragmentation from the shipping containers, the vehicle body, and rocks from the road will all become secondary fragmentation hazards. In the case of a bulk explosive shipment, the secondary fragmentation hazard will also be a problem.

Thermal Energy - At the time of detonation, a tremendous amount of heat energy will be released. In the immediate area of the detonation, metal will melt and combustible materials will be ignited. Personnel in the thermal energy release area will be severely burned.

EVACUATION - HOW FAR IS ENOUGH?

Evacuation Distance - The evacuation distance can be based on fragmentation or the blast wave pressure (See Slide 3.Evacuation Distances).

Fragmentation - Per the Department of Defense Explosive Safety Board (DDESB), the fragmentation distance for one (1) each 155 mm projectile is 2,699 feet. There is little difference on the fragmentation distance for a truck load of 500 each 155 mm projectiles.

Blast Wave Pressure - Per the DDESB, the blast wave pressure distance for 500 each 155 mm projectiles is 6,476.95 feet. This distance is based on the formula of the “net explosive weight cube root X 328 = blast wave pressure distance”.

No Standard Evacuation Distance - There is no standard evacuation distance for munitions. The fragmentation and blast wave pressure distances will vary with both the size of the munition for fragmentation and total explosive weight for blast wave pressure. Depending on which regulating

agency is in charge, the preliminary unknown explosive safety distance can vary greatly from as little as 1,250 feet to one (1) mile.

WHO DO YOU ASK FOR HELP?

Explosive Ordnance Disposal - There are a wide variety of agencies that have regulatory authority and emergency response capability. There is only one group of personnel who are trained to evaluate and initiate the appropriate procedures for munitions that have been involved in an accident and these are Explosive Ordnance Disposal (EOD) specialists. These personnel have received many months of training with emphasis on armed or damaged munitions and explosives.

EOD Organizations and Their Responsibilities - Each branch of the U.S. military has their own EOD organizations with specific responsibilities.

U.S. Army EOD - In addition to EOD services on Army installations, the Army EOD units have an off installation response requirement. These areas include all land to the high tide mark within the United States.

U.S. Navy EOD - In addition to EOD services on Navy installations, the Navy EOD units have an off installation underwater response requirement. These water areas include all water to the high tide mark within the United States.

U.S. Air Force EOD - The Air Force EOD units are primarily responsible for EOD services on Air Force installations only. As a rule, Air Force EOD personnel cannot respond for off installation responses without special permission of the installation commander.

U.S. Marine Corps - The Marine Corps EOD units are primarily responsible for EOD services on Marine Corps installations. Most Marine Corps EOD units will respond in the local area of the assigned installation.

52nd Ordnance Group, Fort Gillem, Georgia - All Army EOD units are under control of the 52nd Ordnance Group, Fort Gillem, Georgia. Each EOD Battalion and assigned EOD Companies are assigned to specific geographic locations throughout the United States.

Emergency Preparedness - As part of every municipality's emergency planning, the 52nd Ordnance Group should be contacted to determine which EOD Battalion and EOD Company is assigned to their area. This information should become a part of each emergency manual to ensure the correct contacts are made to respond to a munition or explosives accident.

Emergency Request - In the event of an emergency involving munitions or high explosives, the 52nd Ordnance Group can be contacted to request Army EOD assistance.

Other Emergency Contacts For Munitions and Explosives Accidents - The following organizations may also be contacted for assistance.

U.S. Army Operations Center - (703) 697-0218

U.S. Army Engineering & Support Center:

Regular Hours (256) 895-1582/1507/1510

After Hours (256) 895-1180

Other Agencies - There are other agencies that can provide assistance. Most of these agencies are regulatory agencies that have personnel trained in general explosive safety and have varying degrees of explosive hazard response capabilities.

NOTE: Unless an agency has former military EOD personnel on their staffs, they do not have the technical training and skills required to evaluate an accident involving military munitions or high explosives.

U.S. Government Agencies

Bureau of Alcohol, Tobacco, and Firearms (BATF)

Department of Transportation (DOT)

U.S. Environmental Protection Agency (USEPA)

U.S. Coast Guard

State and Local Government Agencies

Police or Fire Department Bomb Squads (no to very limited ordnance training)

Fire Marshals Office

OEW Contractors

Human Factors Applications, Inc.
EPA Region III

Ordnance & Explosive Responses
Chemical Emergency Preparedness & Prevention Conference

Human Factors Applications, Inc.

UXB International

EOD Technology

ECC, Inc.

USA Environmental

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| Division 1.2 | Explosives With A Non-Mass Detonating - Fragmentation (Projectile) Hazard |
| Division 1.3 | Explosives With A Mass Fire Hazard |
| Division 1.4 | Explosives With A Moderate Fire - No Blast Hazard |
| Division 1.5 | Very Insensitive Explosives I.E. Blasting Agents Such As ANFO |
| Division 1.6 | Extremely Insensitive Ammunition |

EVACUATION - HOW FAR IS ENOUGH?

Evacuation Distance - Based On Fragmentation or The Blast Wave Pressure

*** Per the Department of Defense Explosive Safety Board (DDESB)**

Fragmentation - *Fragmentation Distance For One (1) Each 155 mm Projectile Is 2,699 Feet.

(There is little difference on the fragmentation distance for a truck load of 500 each 155 mm projectiles.)

Blast Wave Pressure - *Blast Wave Pressure Distance For 500 Each 155 mm Projectiles Is 6,476.95 Feet.**

****Net explosive wieght³ x 328 = Evacuation Distance**

Slide 3. Evacuation Distances

Emergency Support for Munitions and Explosives

**52nd Ordnance Group, Fort Gillem, Georgia
(404) 363-5953 / 3333**

Other Emergency Contacts

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